

2010-2011 LAND RECLAMATION PROGRAM BIENNIAL REPORT



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

The cover photo is Continental Coal's Panther Creek Mine. It is a reclaimed surface coal mine located in Bates County.

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Missouri Department of Natural Resources

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Land Reclamation Program

Introduction

Mining activity in Missouri began as early as the 1740s, for mineral commodities such as lead, iron, limestone, sand and gravel. Coal mining, however, began in Missouri in the 1840s. With no legislation or regulation of these operations, there were as many as 67,000 acres left unreclaimed by coal-mining operations. An estimated 40,000 acres were left abandoned from the mining of other commodities. Missouri was left with a legacy of acid-mine drainage, dangerous highwalls, toxic mine spoils, dangerous mine shaft openings, unvegetated and barren soils, soil erosion and stream sedimentation.

The Missouri Department of Natural Resources' Land Reclamation Program was established in 1974 to regulate present mining operations and to reduce or eliminate the issues caused by coal mining operations prior to laws regulating such operations were enacted. The Land Reclamation Program works to ensure today's mining industry remains in compliance with Missouri Law Chapter 444 (Rights and Duties of Miners and Mine Owners). The law includes several chapters enforced by separate units within the Land Reclamation Program. The Industrial Minerals and Metallic Minerals Unit is responsible for sections Metallic Minerals Waste Management RsMo. Chapter 444.350-444.380 and the Land Reclamation Act



Earthworks, Ste. Genevieve County

Land Reclamation Commission

Public Members

Jim DiPardo, Chairman
St. James

Dr. Gregory Haddock,
Associate Professor of Geography
Northwest Missouri State University

Dr. Leslie Gertsch,
Associate Professor of Geological Engineering,
Missouri University of Science & Technology,
Rock Mechanics and Explosives Research Center, Rolla

Col. John Riffle, Pleasant Hill

Statutory Members

Robert Ziehmer, Director
Missouri Department of Conservation

Joe Gillman, State Geologist
Division of Geology and Land Survey Director
Missouri Department of Natural Resources

John Madras
Director of Water Protection Program
Clean Water Commission

Cottonwood Creek Reclaimed Coal Mine



Land Reclamation Mission:

To assure beneficial restoration of mined lands and to protect public health, safety and the environment from the adverse effects of mining within the state of Missouri.

RsMo. Chapter 444.760-444.790. The Projects and Inspection Unit and the Permits, Contracts and Design Unit are responsible for the Surface Coal Mining Law RsMo Chapter 444.800-444.970.

The state regulations further define these laws. These laws are available in their entirety in the Rules of Department of Natural Resources Division 40 - Land Reclamation Commission Chapters 1 through 10 for coal and industrial minerals. Metallic Minerals regulations are found at Rules of Department of Natural Resources Division 45 - Metallic Minerals Waste Management Chapters 1 through 8.

The ultimate responsibility of the program is to ensure mine sites in Missouri are returned to a suitable land use and the adverse effects from active mining operations are minimized. When properly reclaimed, these areas can once again be used as farm

lands or wildlife areas. Wildlife habitat remains a primary concern of the Land Reclamation Program. Whenever possible, abandoned mines are reclaimed with wetlands, native prairie grasses and trees that are part of Missouri's history. Declining coal production in no way decreases the responsibilities of the Land Reclamation Program.

Monthly inspections of each mine continue to be performed long after the last ton of coal is removed. Revisions to permits and reclamation changes continue to be submitted for review and approval, as operators fine-tune their post-mining land use plans. Bond release requests increase in number and in size as more ground is reclaimed to acceptable standards. In effect, reclamation activities consume a far larger percentage of time and effort than the actual mining of coal itself.

This biennial report provides information and statistical summaries concerning the activities and business accomplishments of the Land Reclamation Program and its efforts to reclaim mined land during fiscal 2010 and 2011.

For more information, contact the department's Land Reclamation Program at 800-361-4827 or 573-751-4041.

LAND RECLAMATION PROGRAM AND ADMINISTRATION

Organization

The Land Reclamation Program was originally established in the Omnibus State Reorganization Act of 1974. This act created the Department of Natural Resources and placed the Land Reclamation Commission (created by Missouri Statutes Chapter 444) under its authority. The Land Reclamation Commission directs the staffing and operations of the program within the Missouri Department of Natural Resources' Division of Environmental Quality.

The seven-member commission includes three statutory members - the state geologist, the director of the Missouri Department of Conservation and the staff director of the Clean Water Commission. The governor, with Senate approval, selects four public members. Of these four,

only two may be of the same political party. Only one member of the commission may have a direct link with the mining industry.

The Land Reclamation Program consists of the administrative, abandoned mines lands, coal and non-coal units. A total of 24 full time staff members comprise the program and are divided between the four units. Together they are responsible for administration of the program, reclaiming abandoned mine lands and conducting inspections at all active mining operations in Missouri.



Pea Ridge Resources Iron Ore Mine Wetlands

2010 - 2011 Program Highlights

Coal

At the start of fiscal year 2010 Missouri had 6,046 acres permitted and bond forfeiture by the end of fiscal year 2011 only 4,890 acres remained. The acreage and permits continue the trend to decrease as the demand for high sulfur coal in Missouri also decreases. The Land Reclamation Program released reclamation liability for four permits covering 1,180 acres at bond forfeiture sites and consequently two inspectable units were removed as well. Releases of reclamation liability for permanent program permits were approved for 415.2 acres cover by four permits and three inspectable units.

Non-coal

The Non-Coal Unit has two noteworthy accomplishments for years 2010 and 2011. The first accomplishment is getting all field staff equipped with the same mobile laptop computer system coupled with ARC GIS and real time GPS capability. The mounting system in the vehicles is similar to Missouri State Highway Patrol computer mounting systems for safety. Inspectors are now producing maps, filling out forms and inspection reports in the field. Staff developed an inspection report checklist that turned out to be a huge timesaver. All of the non-coal inspectors use the checklist and laptops. In 2011, all 513 of the non-coal inspection reports were issued

on an average of nearly a half day; 0.577 days on average to be exact. Just for comparative purposes in 2002 and 2004 it took seasoned inspectors more than 16 days to issue an inspection report. This also means the time saving technique allows the inspector to get back out in the field faster to conduct additional inspections. Now the laptops work almost flawlessly in the field. Mining operators are impressed with the mapping and GPS technology used by the staff.

The other and most significant accomplishment involved the processing of the two Fruitland Quarries permit applications that received more than 5,000 letters of opposition. This involved keeping the Fruitland Quarries webpage updated every night with new letters, approximately 200 letters over a 25 day period being electronically scanned for people to view the next day after being received. Mailing addresses were also updated every day to keep work flows from being backed up. Approximately 150 people were in attendance during the January 2011 meeting of the commission with some being transported by bus from the Fruitland area. The commission meeting lasted until about 4:45 p.m. in January and the commission went in to closed session. The commission did issue a permit to one of the quarries and ordered a hearing for the other quarry. As of late December 2012, these two sites are still in litigation.

Abandoned Mine Land Unit

The Land Reclamation Program has made significant progress toward reclaiming Missouri's most severe abandoned coal mine problems. Since 1980, 156 reclamation projects, totaling 4,485 acres have been completed. These formerly barren and acidic wastelands are being reclaimed to productive uses such as recreation, pasture, forage and wildlife habitat. Acid mine drainage is being mitigated returning streams and lakes to productive uses and restoring aquatic biota. A total of 267 dangerous coal and non-coal mine openings have been closed, protecting Missouri citizens and property. The tables located on pages 14 and 15, provide details as to the types and numbers of problems reclaimed. Despite these significant accomplishments, an additional 8,000 acres of abandoned coal mine lands and possibly hundreds of extremely dangerous non-coal mine openings remain to be reclaimed as grant funding becomes available. At the end of the reporting period, a construction contract was being awarded for the Harrisburg/ Thornhill Reclamation Project and engineering designs were being prepared for four additional reclamation projects covering approximately 156 acres.



Herculanum Smelter Stag Storage Area Containment Berm

COAL MINING

Introduction and Purpose

Through growing national concern over the environmental degradation caused by coal mining, Public Law 95-87 was passed in 1977 by the U.S. Congress. This law, also known as the Surface Mining Control and Reclamation Act, dictated specific requirements for the reclamation of coal mined land, and also established state regulatory authorities for the enforcement and monitoring of surface mine reclamation activities. The act also established programs and funding for reclaiming coal mine lands mined prior to May 2, 1977.

On May 3, 1978, the legislature amended Missouri's Strip Mine Law establishing Chapter 444.535 RSMo, commonly referred to as the Interim Program Law. Requirements of this law include:

- Topsoil must be removed and replaced to a minimum 6 inch depth.
- All prime farmland soils must be removed and replaced to 40 inch depth.
- All mined land must be reclaimed to an equal or better land-use capability.
- Mined land must be backfilled and graded to approximate original contour.
- Coal waste and other acid-or toxic-forming material must be covered with a minimum of 4 feet of non-toxic material.
- A permanent vegetative cover compatible with the pre-mining land use must be established.

On May 17, 1982, the Missouri legislature passed the Surface Coal Mining Law (Chapters 444.800 - 444.970) to match federal standards established in the Surface Mining Control and Reclamation Act. The law made changes to the permitting process and granted the Land Reclamation Commission the authority to administer the abandoned mine land program. Coal companies were now required to submit baseline information about the hydrology,

geology, soils, fish and wildlife and cultural resources of the proposed mining area along with a detailed description of the proposed operation and reclamation plan. The most significant change to the reclamation requirements was that prime farmland soils must be removed and replaced to a 48 inch depth. These requirements, known as the Permanent Program Law, continue in effect to the present day.

Over recent years, Missouri coal production has declined from 4.2 million tons in 1987 to approximately 452 thousand tons during 2009. This decline is largely due to industry demands for low-sulfur, western coal needed by power plants to reduce air pollution and meet emission standards required by the federal Clean Air Act. Most of Missouri's coal reserves contain relatively high sulfur content, ranging from 2 to 7 percent by weight. However, Missouri coal has a relatively high British Thermal Unit, or BTU, compared to western coal. Some power plants have opted to mix Missouri's coal with lower BTU western coal to increase energy production without exceeding sulfur emissions.

Hume Coal Mine



Over the last two fiscal years, coal mining has been concentrated in an area in southwest Missouri where, in places, coal seams contain lower levels of sulfur. During this time period, the Land Reclamation Program issued one coal mining permit, which expanded an existing mine by 114 acres. This active mine site is located in Bates County. At the end of fiscal year 2011, one company held two Missouri surface coal mine permits producing coal. The remaining permitted mines in Missouri were in various stages of reclaiming the land to regulatory standards. Of these permits the program received and approved four permit revisions for land use changes.

Land Reclamation Program staff closely monitors coal mining operations, including both coal removal and reclamation activities. Monthly inspections of each mine are performed to ensure reclamation requirements are adhered to and continue until the reclamation liability release proving hydrologic balance of surface and groundwater, soil stability and vegetative production for a minimum of five years after final grading and seeding.

Permitting

Staff members are responsible for reviewing permit revisions and new permit applications. Program personnel are professionally trained in specific technical areas and are responsible for reviewing technical plans with respect to their area(s) of expertise. Technical areas that must be reviewed include engineering, blasting, soil science, geology, hydrology, revegetation, land use plans, fish and wildlife protection, cultural and historical resources and reclamation technology. Staff members review all coal permit applications for adequacy and recommend approval or denial to the Land Reclamation Program staff director.

The staff also conducts regular evaluations of existing permits and also provides technical assistance to the mining industry and the public.

A thorough review of surface coal mining permit applications, permit revisions and other permit-related actions are necessary to ensure all requirements of the law and regulations are met.

Reviewing permit processes includes determining all applications, as well as the review process itself, meet all legal and administrative requirements. The permitting requirements for coal mining are extensive, requiring careful evaluation of diverse and comprehensive environmental topics such as soil characteristics, surface and subsurface water quality controls, fish and wildlife information, cultural resources and land use planning. Reviews also focus on specific details such as engineering designs for sedimentation ponds and water diversions, blasting plans and hydrogeologic data to determine the probable hydrologic consequences of mining. Other permitting responsibilities include evaluating each applicant's legal compliance history with past mining activities and ensuring all public review requirements are fulfilled. Staff members also coordinate with other regulatory agencies to ensure the company proposing to conduct the mining activity has obtained other necessary environmental permits.

Bond Releases

Reclamation begins immediately after coal is removed from a strip mine pit. Regulations dictate a pit must be completely backfilled and graded no later than 180 days after coal removal. Topsoil must then be redistributed within an additional 270 days. The area must then be seeded during the first available growing season, with specific vegetation sufficiently established to control erosion by the end of the second year. Sediment ponds, diversions, explosive storage areas and maintenance pads also are subject to reclamation requirements after they become inactive or are no longer needed as part of the mining operation. Only when these requirements are met can an operator obtain a release of reclamation bonds.

Bonding requirements were changed in 2006 for surface coal mines from a bond pool, with a flat bonding rate for all areas, to full cost bonding. Full cost bonding requires an engineering evaluation of the area to be mined determining the worst case scenario in terms of cost to reclaim should the company, for whatever reason, be unable to complete full reclamation. The bond amount is determined by the Land Reclamation Program and is then posted by the company before a permit to mine coal is approved and issued. The bond is held in escrow by the Land Reclamation Program until such time as reclamation is completed and approved by the staff director of the program. Bonds are released in phases as regulated reclamation milestones are met.

Table 1

Surface Coal Mining Permit Actions for Fiscal Years 2010 and 2011		
	SFY10	SFY11
New surface mining permit applications received.	1	1
New surface mining permit applications approved.	1	1
New exploration permit applications approved.	0	0
Renewed exploration permit applications approved.	0	0
Permit amendments received (permit revisions, permit renewals, permit transfers.)	5	7

The permanent program activity for this period resulted with Associated Electric Cooperative successfully achieving liability release of the remaining acreage on two permits consisting of 11.3 acres. The company also received various liability releases for the Prairie Hill Mine encompassing two different permits with 22 acres meeting Phase I requirements, 38.5 acres meeting Phase II requirements, and 38.5 acres meeting Phase III requirements.

Background Information as Noted in the 2008-2009 Report

In accordance with the legal consent agreement entered into with Continental Insurance and Beachner Construction an over bonded amount of \$144,000 was released after the sureties mobilized for reclamation. The release was to the sureties for a portion of a permit associated with Alternative Fuels Incorporated, or AFI. Shortly after the surety's mobilization one of the landowners filed suit against Missouri for the reclamation plan that had been approved. Several months following the filing of the lawsuit AFI received a multi-million dollar court settlement from the State of Missouri for interfering in a business deal. The company filed bankruptcy as there were more financial claims against the company than available funds. Since the company does have the financial resources to perform the reclamation the sureties have suspended any further work until it is legally clear what reclamation plan will be followed and if the company will be required to complete the reclamation.

During this period 2010-2011 Christopher J. Redmond with Husch Blackwell LLC, was assigned as the bankruptcy trustee for AFI. A reclamation plan was approved for permit #1990-01 as prepared by TRIAD Environmental Services and work began shortly afterwards.

Permit revisions were approved by the program director for Permits 1991-02 and 1996-01. Two of the three landowners associated with permit 1991-02 appealed to the Administrative Hearing Commission as being adversely affected by this decision. Since reclamation is proceeding AFI was moved from annual inspections to monthly inspections starting in June 2011.

Inspections

Reclamation activities are closely monitored to ensure the required performance standards are met and the reclamation plans approved in the company's mining permits are followed. Coal mine inspections are performed monthly.



Hume Coal Mine

On-site inspections serve three primary functions:

- Ensure an operation is functioning in a manner consistent with applicable state laws.
- Ensure an operation is fully complying with the conditions of the permit.
- Provide a public record about the status of mining and reclamation at a site.
- Two styles of inspections are done, termed a complete and partial. Complete inspections are required once per calendar quarter. They involve a complete review of an operator's compliance with all permit conditions and state statutes. As the name implies, partial inspections are a review of an operator's compliance with some of the permit conditions and state statutes.

Many aspects of a mining operation are evaluated during an inspection to ensure the following:

- Mining occurs within the confines of the permit.
- Topsoil is being salvaged and stockpiled.
- All stormwater runoff from mined areas enters sedimentation ponds.
- Pits and other areas of mine disturbance are promptly backfilled and graded.
- Topsoil is replaced to the required thickness.
- Vegetation is quickly reestablished in order to control erosion.



Site inspection of Continental Coal – Hume Mine.

Monthly inspections continue after an operation ceases mining coal. Continued monitoring ensures reclamation continues in an expedient manner and all conditions of the reclamation plan are followed. Only when an operator gains approval for a Phase II release (vegetation sufficient to control erosion) does the inspection frequency decrease from monthly to quarterly.

Enforcement

Notices of Violation may be issued when an operator is out of compliance with the conditions of the permit or with state regulations. These are only issued after efforts to correct noncompliance through the process of conference, conciliation and persuasion prove ineffective. In general, if a notice of violation is issued, a monetary penalty will also be issued. Because inspections are conducted each month, it is rare a serious noncompliance would exist. Well trained inspectors are able to identify when a mining or reclamation process is getting off-track in time to rectify the situation with the company before the need to issue formal enforcement occurs.

Cessation orders are an elevated form of a notice of violation and are a more serious form of enforcement. The department will issue an order when a condition or practice at the mine site constitutes imminent danger to the health and safety of the public or imminent environmental harm to land, water or air resources. Orders may require the immediate cessation

of mining until the problem is corrected. Cessation orders, because of their seriousness, require immediate abatement by the operator. Failure to do so may lead to a revocation of the mining permit. Cessation orders may also be issued for a failure to abate a notice of violation within the required time frame.

If cessation orders are not abated in a timely manner through the appropriate action on the part of the mining company, the next level of enforcement action is a Show-Cause Order. This means the operator is ordered to show why their permit should not be revoked and the reclamation bond forfeited. Show-Cause Orders may also be issued for other reasons such as for patterns of violations and uncorrected delinquent reclamation.

Three notices of violation and one notice of delinquent reclamation were issued. After proceeding through the administrative appeals process one notice of violation and the notice of delinquent reclamation were vacated by the director.

Bonding

Missouri's Surface Coal Mining Law (Chapters 444.800 - 444.970) was amended in 2006 to address changes mandated by the federal Office of Surface Mining. A condition of Missouri's reacquisition of primacy was to change the bonding system in Missouri from one of a bond

pool to one of full cost bonding. The necessary regulation changes were made prior to full return of primacy to the state on Feb. 1, 2006 through emergency rulemaking. These rules remained in effect until such time as the normal rulemaking process was completed.

The former bond pool approach relied on a set amount of money per acre being posted by the permit applicant prior to receiving a permit to engage in surface mining of coal. This set amount was supplemented by payments into a bond pool from all companies based upon yearly coal production. The present full cost bond approach requires the applicant to provide an estimate of the cost to reclaim a surface mine given the worst case scenario of the mining operation. That estimate is reviewed by program engineers and, when verified, that dollar amount is the amount of bonding required to be posted prior to the issuance of any surface mining permit for coal.

Bond Forfeiture Reclamation

Each permitted coal company in Missouri is required to provide financial assurances to ensure reclamation of the site after coal removal. Upon completion of reclamation to applicable standards, the coal company receives a release from the Land Reclamation Program. Should a coal company fail to provide reclamation to applicable standards the bonds are forfeited to the Land Reclamation Program and these bonds are used by the program to provide reclamation to the site mined by the coal company.

The Land Reclamation Program continues to reclaim bond forfeiture sites resulting in the complete release of two inspectable units with four permits covering 1,180 acres.

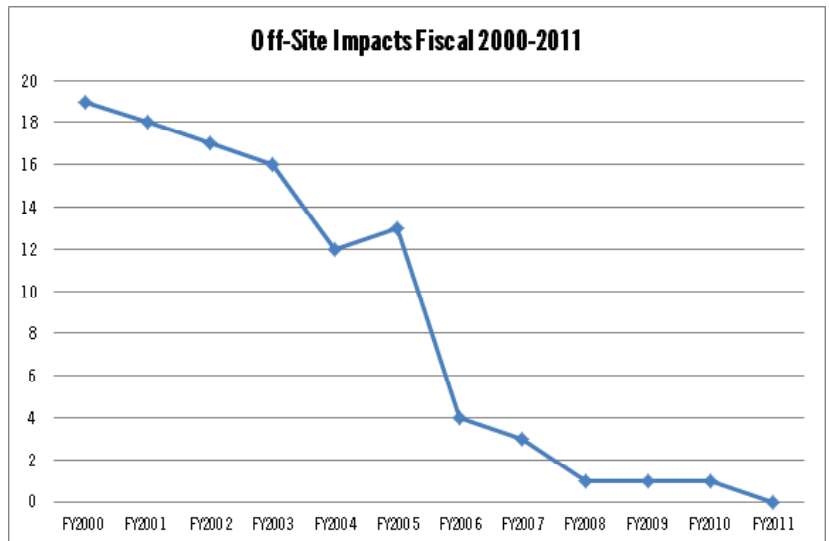
Off-Site Impacts

An off-site impact is defined as anything resulting from a surface coal mining and reclamation activity or operation that causes a negative effect on resources, such as people, land, water, structures, etc. The program must regulate or control the mining or reclamation activity or result of the activity causing an off-site impact. In addition, the impact on the resource must be substantiated as being related to a mining and reclamation activity and must be outside the area authorized by the permit for conducting mining and reclamation activities.

At the Hume mine one off-site impact was noted with a minor effect on water quality as a result of sampling analysis levels exceeded of National Pollution Discharge Elimination System permit limits. The pond banks were seeded and mulch and the permit limits have not exceeded since resolving the off-site impact.



Mo Mining Bond



ABANDONED MINE LANDS

Reclamation Funding

The Abandoned Mine Land, or AML, activities of Land Reclamation Program are funded by the U.S. Department of Interior's Office of Surface Mining Reclamation and Enforcement AML Reclamation fund. All of the money in the fund is collected from active coal mining companies through fees charged on the tonnage of coal mined since passage of Surface Mining Control and Reclamation Act. The Office of Surface Mining Reclamation and Enforcement distributes the fund to the eligible states and American Indian tribes. To date, Missouri has received \$77.1 million in AML grants and cooperative agreements from the fund to conduct reclamation work

in Missouri. Missouri has an excellent record for obligating the funds received. Through state fiscal year 2011, of all grants received 99.9 percent were contractually obligated for the completion of reclamation projects.

Because of steadily declining coal production since the late 1980s, Missouri and other midwestern states have received decreasing allocations. In 1987, the U.S. Congress established an annual minimum base funding level in the amount of \$2 million to allow states with significant abandoned coal mine problems but limited coal production to continue their AML programs. However, the \$2 million minimum base amount was consistently being reduced to \$1.5 million in the federal appropriations process. As part of the 2006 amendments, the minimum base funding to states was incrementally increased over five years to the current maximum of \$3 million per year. And furthermore, these funds are administered as mandatory grant funds that no longer go through the federal appropriation process.

Reauthorization

The Abandoned Mine Land reauthorization was signed into law by President George W. Bush on Dec. 20, 2006. Following a three and one-half year legislative debate in congress over AML reauthorization, the comprehensive legislation was passed as part of the Tax Relief and Health Care Act of 2006. This new bill represents the culmination of years of work by the states, tribes, federal government, and other supporters to address the future of the AML program. These new changes in federal law have resulted in substantial increases in AML funding to states and tribes and allowed the program to focus AML reclamation for projects that benefit public health and safety.

The AML reauthorization, which amended the 1977 Surface Mining Control Act, is a significant windfall that will provide many benefits to the Missouri AML Program. It extends federal AML fee collection

AML Accomplishments

Problem	Reclaimed	Under Construction	Under Design	Total
AML Projects (#)	149	3	4	156
Mine Openings (#)	267	0	0	267
Highwall (ft.)	97,571	4,300	0	101,871
Hazardous Facilities	33	0	0	33
Subsidence (ac.)	7	0	0	4
Surface Burning	19	0	0	19
Underground Mine Fire (ac.)	7	0	0	7
Unsanitary Trash Dumps (ac.)	76	1	0	77
Dangerous Piles/ Embankments (ac.)	706	92	0	798
Clogged Streams (mi.)	10.8	0	0	10.8
Clogged Stream Lands (ac.)	1,603	10	0	1,613
Polluted Waters: Human Consumption, Agricultural or Industrial (#)	57	3	1	61
Hazardous Impoundments (#)	19	1	0	20
Polluted Impoundments (#)	96	0	0	96
Haul Road (ac.)	1	0	0	1
Spoil (ac.)	1,567	81	0	1,648
Gob (ac.)	148	3	0	151
Slurry (ac.)	69	0	0	69
Total AML Acreage	4,299	187	0	4,485

authority and funding of the AML program for at least 15 years until the year 2021. The new changes will double the amount of AML funds Missouri and the other minimum base states receive for completing reclamation projects that benefit public health and safety. In addition, the State of Missouri is designated as a recipient of AML funds, even if it cannot continue to operate the coal regulatory program.

Other notable changes made by the 2006 Amendments include:

- AML fees reduced by 20 percent over the duration of the extension.
- Previously unappropriated state share balances will be paid out to states and tribes over a seven-year period.
- AML allocation formula modified to direct more funds to areas with most historic coal-related problems.
- AML funds distributed annually outside of congressional appropriation process.
- Lien provisions streamlined.
- Redefines priorities for AML funding.

These changes result in dramatic and far-reaching effects to the AML program. The states, tribes, and federal Office of Surface Mining worked cooperatively to ensure a smooth implementation of the 2006 amendments in a way that benefits citizens of the nation's coalfields.

Inventory and Ranking

Public Law 95-87 requires the highest priority abandoned coal mine sites be reclaimed before problems created by mining other commodities are addressed. The order in which abandoned mine land is reclaimed is initially determined by classifying the problem sites into three broad priority categories. Priority I and II problem sites are reclaimed first since they pose a threat to the public health and safety. Priority

*Key to AML problem abbreviations:

IRW -Industrial or residential waste dump.

VO - Vertical opening.

SA - Spoil area.

P - Portal.

SL - Slurry (coal waste).

DH - Dangerous highwall.

GO - Gob (coal waste).

DPE - Dangerous piles or embankments.

PWAI - Polluted water agricultural/industrial.

CS - Clogged stream conditions.

S - Subsidence.

WA - Water problems (acid mine drainage and sedimentation).

HEF - Hazardous equipment and facilities.

AML Reclamation Accomplishments (July 1, 2009 - June 30, 2011)

Final Designs Completed

Project Name	County	Acres	AML Problems*
Harrisburg/Thornhill	Boone/Howard	75	DPE, CSL, IRW, GO, PWAI, SA
Montrose Badlands	Henry	33	DH, DPE, CSL, PWAI, SA
Highland Highwall	Henry	65	DH, HWB, DPE, SA
Bee Hollow	Macon	10	DH, DPE, IRW, SA
DeSoto/ Mapaville Shafts	Jefferson	16	16 VO's
McRuer Shaft	Newton	1	VO
Bowen Shafts	Johnson	2	2 VO's
McDowell Shafts	Barry	2	2 VO's
Virginia Mine Shafts	Franklin	2	2 VO's
Goldfinch Shaft	Newton	1	VO
Simms Shaft	Jasper	1	VO
ABC Shaft	Jasper	1	VO
Total Acres		209	

Construction Contract Awards

Harrisburg/ Thornhill	Boone/ Howard	75	DPE, CSL, IRW, GO, PWAI, SA
Montrose Badlands	Henry	33	DH, DPE, CSL, PWAI, SA
Bee Hollow	Macon	10	DH, DPE, IRW, SA
DeSoto/ Mapaville Shafts	Jefferson	16	16 VO's
McRuer Shaft	Newton	1	VO
Bowen Shafts	Johnson	2	2 VO's
McDowell Shafts	Barry	2	2 VO's
Virginia Mine Shafts	Franklin	2	2 VO's
Goldfinch Shaft	Newton	1	VO
Simms Shaft	Jasper	1	VO
ABC Shaft	Jasper	1	VO
Total Acres		144	

Construction Contract Completions

West Montrose	Henry	61	DH, DPE, HWB, PWAI, IRW
Bee Hollow	Macon	10	DH, DPE, IRW, SA
DeSoto/ Mapaville Shafts	Jefferson	16	16 VO's
McRuer Shaft	Newton	1	VO
Bowen Shafts	Johnson	2	2 VO's
McDowell Shafts	Barry	2	2 VO's
Virginia Mine Shafts	Franklin	2	2 VO's
Goldfinch Shaft	Newton	1	VO
Simms Shaft	Jasper	1	VO
ABC Shaft	Jasper	1	VO
Total Acres		97	

III problem sites that adversely affect the environment may be addressed simultaneously if they are located adjacent or are contiguous to priority I and II problems. Otherwise standalone priority III features may not be reclaimed until all priority I and II sites have been reclaimed. P.L. 95-87 also provides that, at the request of the governor of the state or head of the tribal body, certain priority I non-coal reclamation projects may be undertaken on a case-by-case basis before the priorities related to past coal mining have been fulfilled. The Land Reclamation Program has been closing extremely dangerous non-coal mine shafts under this provision since 2001. The information pertaining to Missouri's abandoned mine lands is contained in the AML inventory. This database currently contains 266 AML problem sites. It is continually updated as existing site conditions change or new sites are identified.

On an annual basis, the unfunded high priority (priority I and II) problem sites are ranked and selected for future reclamation work according to the severity of existing problems. To date, an estimated \$99 million in priority I and II AML problems have been inventoried in Missouri. Of this total, \$46 million remains unfunded.

Missouri's Abandoned Coal Mine Land Emergency Program

The Land Reclamation Program is responsible for investigating all AML emergency complaints in Missouri and conducting reclamation work when emergencies are declared. An AML emergency is a sudden event related to past coal mining that has a high probability of causing substantial harm. There must also be a need to abate the emergency situation more quickly than would be possible under normal AML program operations. Sometimes an emergency complaint constitutes an eligible coal mine problem, but the situation does not meet the emergency criteria. In this case, reclamation work could still be undertaken by the Land Reclamation Program under the normal AML program. The proposed reclamation project, however, would be subject to the project ranking and selection process and would have to compete for available grant funds along with other priority I and II problem sites.

During Fiscal Year 2010 and 2011 the Land Reclamation Program conducted one coal emergency investigation. This emergency complaint involved foundation settlement problems at a private residence located in an area of past underground mining. The Land Reclamation Program conducted an on-site investigation and ruled out coal mine subsidence as a possible cause for the complaint.

Feature Projects

Harrisburg/Thornhill Reclamation Project

The AML unit and the Office of Administration, Federal Management Design and Construction contracted Gredell Engineering Resources Inc. of Jefferson City as the primary design consultant for the Harrisburg/Thornhill Reclamation Project. The project is located near Harrisburg and consists of four separate sites, three in Boone County and one in Howard County involving eight different landowners. The project was awarded to C.L. Richardson Construction Co. Inc. located in Ashland in the amount of \$1,217,669. The start date of the project was July 26, 2010 and the project was completed on July 19, 2011 at a cost of \$1,299,448. Several change orders during the course of construction was responsible for the increased amount of the contract. The project reclaimed approximately 72 acres of abandoned coal mine lands while eliminating several health and safety



Harrisburg before and after

hazards. The reclamation included the grading and shaping of 34 acres of dangerous piles and embankments, 31 acres of spoil area, three acres of coal gob, two acres of clogged stream lands, one acre of residential waste, and the elimination of a one-acre acidic pond. Upon completion of earthmoving activities the areas were seeded to a warm season grass mix including forbs or a cool season grass/legume mix.

West Montrose Reclamation Project

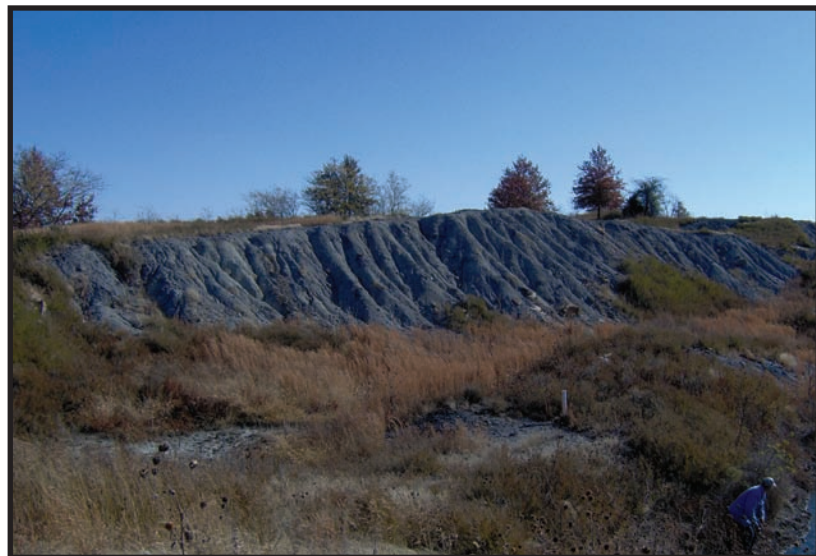
The AML unit initiated the design for the West Montrose Reclamation Project. The project is located on privately owned land adjacent to County Road SW700, approximately two miles northwest of Montrose in Henry County. The project reclaimed approximately 60 acres of abandoned coal mine lands while eliminating the health and safety hazards associated with 1,100 ft. of dangerous highwall located adjacent to a frequently traveled county road. Additional features addressed included the grading and re-contouring approximately 36 acres of dangerous piles and embankments, 24 acres of priority three mine spoils, backfilling a portion of a hazardous water body and removing residential waste. The project area was then seeded with a series of green cover crops prior to a final seeding of cool season grasses and legumes. The project was awarded to Hale Fencing and Bobcat Services LLC from Henley in the amount of \$735,615. Notice to proceed was given on June 26 with substantial completion accomplished on Aug. 6, 2010. Final payment amounted to \$774,999.

Bee Hollow Reclamation Project

The Bee Hollow reclamation project started construction on March 19, 2010. BRS Construction of Edina was awarded the contract. This reclamation addressed approximately ten acres of abandoned mine lands located on and adjacent to the Bee Hollow Conservation Area on Missouri Department of Conservation property. The Bee Hollow Reclamation Project is located along Jackpot Road in southern Macon County approximately one and a half miles west of Hwy. 63 and seven miles south of Macon.

Highland Highwall Abandoned Mine Land Reclamation Project Design

The AML unit initiated the design for the Highland Highwall Abandoned Mine Land Reclamation Project. This project is located on privately owned land off County Road NW 730 and just to the north of U.S. Highway 52, approximately two miles southwest of Calhoun in Henry County. The project will reclaim approximately 85 acres of abandoned coal



*West Montrose -
before and after*

mine lands while eliminating the health and safety hazards associated with one 3,600 feet long highwall and a final pit impoundment, both of which are adjacent to a well-traveled county gravel road. Additional work includes grading and re-contouring approximately 45 acres of poorly vegetated piles and embankments. Upon completion the site will be revegetated with cool season grasses and legumes to reduce erosion. Construction activities began Sept. 19, 2011 and the proposed construction completion date is June 28, 2012. After the construction phase has been completed there will be a sequential planting of a few diverse species of trees to enhance wildlife habitat.

Little Tipple Highwall Abandoned Mine Land Reclamation Project Design

The AML unit through the Office of Administration's Division of Facilities Management, Design and Construction contracted Triad Environmental Services as the primary design consultant to develop the Little Tipple Highwall Abandoned Mine Land Reclamation Project. This project is located on two different locations of privately owned lands just west of County Road 13007, near Hume in southwest Bates County. The project is divided into two separate work areas (the Hilton site located on the north property and the Tally site located to the south).

The project will reclaim approximately 26 acres of AML surface mine lands while eliminating the health and safety hazards associated with one 1,315 feet long highwall and an endwall of 175 feet long, which are both situated immediately adjacent to the county road.

Other activities will include:

- The construction of two rock toes to move the water impoundments further away from the road.
- The excavation to expand one of the existing impoundments as a source for replacement water.
- Grading and re-contouring the areas of disturbance.
- Revegetating the site with warm season grasses and forbs to reduce erosion and to enhance wildlife habitat.

Construction activities should commence in spring 2013 and construction should be complete by fall 2013.

Abandoned Mine Land Non-Coal Reclamation Projects

Although the Land Reclamation Program uses federal money designated to reclaim abandoned coal mines, the money may also be used to reclaim non-coal vertical mineshaft openings if they meet certain criteria. These non-coal problems are allowed to be corrected with a request from the governor if it is necessary for the protection of the public health, safety, and general welfare from extreme danger, thereby meeting priority I problem criteria.

Between July 1, 2009 and June 30, 2011, eight dangerous non-coal shafts were closed in the Joplin/ tri-state mining district. As part of the DeSoto Shaft Reclamation Project, 16 vertical shafts were sealed shut in the east Missouri mining district near Jefferson and Franklin counties. The project area had been mined for lead and zinc at the start of the 1900s and continued until around 1938. Typical closure of these shafts includes dewatering the openings if needed, excavating to bedrock, and constructing a steel-reinforced 4-foot thick concrete plug over the open shaft.

Occasionally a dangerous mineshaft may be closed by backfilling with rock, soil material, or backfilling with concrete to create a monolithic concrete plug. These closure methods are quick and relatively inexpensive but often may not be the best choice. Most of the time, a more costly, yet more permanent closure method is preferred. This more common type of typical non-coal shaft closure consists of excavating the loose soil material around the hole down to the bedrock, placing a four foot thick layer of polyurethane foam in the shaft, placing a wedge-shaped steel-reinforced concrete plug into the top of the shaft and backfilling over the concrete with waste material adjacent to the hole or with any available soil material. A closure of this type typically ranges from around \$12,000 to \$20,000 per shaft but can vary based upon the specific conditions of each shaft.

Currently there are no additional non-coal shafts in the inventory to address. However, it is suspected there are many more open shafts we are unaware of that will need to be closed. Dangerous mine shafts will continue to open up (especially in the tri-state lead/zinc mining district in the Joplin area) and will be investigated and closed to protect the public.

INDUSTRIAL MINERALS

Permitting

Industrial mineral mining permit certificates are issued for a one-year period. The industrial mineral permits must be continually renewed until the Land Reclamation Commission or staff director deems all mined land covered by the permit is fully reclaimed. Approximately 700 new or renewed permits were issued in the past two years. Since some permits contain multiple sites, the number of permitted sites is substantially higher. In addition to the new and renewed permits, staff spent a considerable amount of time reviewing other permit actions, including permit transfers, expansions, amendments and consultations with the Missouri Department of Conservation. Fees collected from industrial mineral permits are used to conduct necessary regulatory functions.

Inspections

Before 2007, the state was historically separated into at least four geographic area inspection units. Now, the state is divided into two geographic area inspection units with at least two inspectors assigned to each unit. Each unit contains about 57 counties. Not all counties have an industrial mineral mine site. When staff wanted the state divided into two regions, it was noted that some areas become more active at times when compared to others. Before the change, one staff member had to investigate a lot of complaints in the southwest portion of the state while inspection staff assigned to the northeast portion of the state had a relatively normal schedule. Now, at least two inspection staff members share an assigned area to help maintain a relatively even workload.

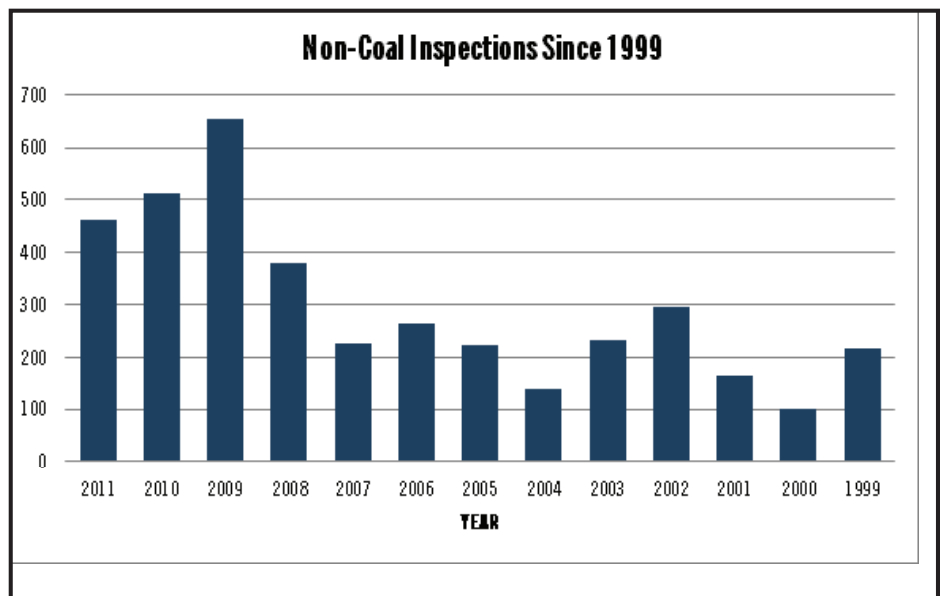
Operators in the business for more than five years have seen changes in inspection staff. Many operators prefer the same inspector each year for the purpose of consistency. The program will accommodate their request as often as possible.

Inspectors are limited to the amount of on-site inspections they can perform in a given year, as they conduct permitting and other actions as well. Mine operations range in size from one acre gravel bars to some sites being greater than 300 acres, such as limestone quarries. In 2010, there were 781 permitted industrial mineral sites, with 513 inspections conducted and 463 inspections were conducted in 2011. These total numbers are an increase from the number of inspections conducted over the past few years.

This increase in inspection numbers are related to:

- Longer employee retention time.
- Increased efficiency for producing inspection reports.
- Fewer turnovers in inspection staff.

The Industrial Mineral Unit projects to have a total of 500 inspections scheduled in 2012 due to a full inspection staff and certified inspectors to conduct investigations. Each of the five inspectors will need to conduct 85 inspections. The non-coal staff conducting inspections at this rate will be able to accomplish inspecting a site once every two years. This is a huge improvement when compared to the last 10 years.





Screen shot of what inspectors see in the field during an inspection.

Types of Inspections

In 2010 and 2011, an average of 488 site inspections were conducted. Inspections typically fit into three categories.

Regular Inspections

Regular open pit inspections are conducted to determine if an operator is in compliance with the approved permit and the applicable performance requirements. Performance requirements checked by inspectors include timeliness of reclamation, safety barriers, lateral support, erosion and siltation control, grading, topsoil handling and revegetation. Inspectors also evaluate each mine site to ensure all mining disturbance is confined to the permitted and bonded area and the approved post-mining land uses are being established.

In-stream sand and gravel inspections now involve performance standards. Inspectors evaluate the mined area on the gravel bar to make sure the material being excavated is unconsolidated. Inspectors also make sure there is no mining below the waterline, no relocation of stream channels, no sorting or washing of gravel at the gravel bar and an undisturbed buffer of 10 feet from the flowing water.

Complaint Inspections

Complaint inspections are conducted after the program receives notification an industrial mineral operation may be in violation of the Land Reclamation Act. Complaints filed may involve blasting, noise, truck traffic, water pollution, digging in flowing water, erosion or siltation. Following an investigation, the inspector and operator are often successful in resolving a citizen's complaint in a timely manner. However, many complaints related to mining operations, such as blasting and noise, are not regulated by the Land Reclamation Program and are referred to the appropriate regulatory authority.

The department requires a complaint be investigated within 30 days. The goal is to respond within 14 days of receiving them. However, an investigation is usually conducted within seven work days. There were 49 complaints filed and investigated in both 2010 and 2011.

Bond Release and Other Inspections

Bond release inspections are conducted at the operator's request when reclamation has been completed. The mining company will also send the landowner a letter announcing the intent to seek a release of the land. The landowner may request a hearing if they feel the land is not properly reclaimed.

The focus of the bond release inspection is to determine if the mine site has been reclaimed in accordance with the reclamation plan. The inspector must evaluate if the operator has established the designated post mining land uses. Post mining land uses may be designated as wildlife habitat, agricultural, development or water impoundment. The staff director is allowed to determine if the bond, or any portion thereof, should be released. When mined land is properly reclaimed a recommendation for bond release is made to the Land Reclamation Commission or staff director. If either the Land Reclamation Commission or staff director approves the request for approval of reclaimed land, the reclamation performance bond is released back to the operator. The commission or staff director approved the release of 822.5 acres of reclaimed mine land in 2010 and 355.5 acres in 2011.

The department and programs are also conducting Environmental Assistance Visits for new operators. Typically, the department allows an operator to conduct operations for a few months before conducting an initial inspection. Inspectors will typically let a new operator conduct operations for a two-month period and then see what changes the operator may need to make to stay in compliance with applicable mining laws. Assistance visits are another type of inspection. If an operator requests an inspection to see how to conform to the mining laws, then an inspector will provide that type of assistance inspection. The latest assistance inspection involved a company that wanted to know what type of activities could be conducted in a pre-law area, sinkhole field and did not want to move topsoil twice. Inspection staff was charged in March 2007 to inspect every site in either an outstanding state or national resource watershed. Inspection staff completes the requirement to visit each mine site within an outstanding state or national resource watershed on an annual basis.

Legislative and Rule Changes

There were changes made to The Land Reclamation Act in 2011. One of the changes involved “burden of proof being placed on the applicant” at 444.773.4 RSMo. Establishing burden of proof involves a formal hearing being held concerning the issuance or denial of an Industrial Mineral permit application. With passage of the new law, instead of the burden of proof being placed on the applicant, the burden is now removed. Now at a hearing concerning the issuance of a permit, the petitioners against the application must establish competent and substantial scientific evidence on the record that the petitioner’s health safety and livelihood will be unduly impaired. The applicant still has the responsibility to refute those allegations. The final decision about whether to issue or deny a permit remains within the authority of the Land Reclamation Commission. This law went in to effect on Aug. 28, 2011.

The second addition to the 2011 Missouri Revised Statutes under The Land Reclamation Act involves a new law titled “Limitations on permits near an accredited school” being placed at 444.771 RSMo. Due to this law change the department is now required to not issue an Air, Water or Land Reclamation permit when a mine plan boundary is within 1,000 feet of any real property where an accredited school has been located for five years. This law became effective on July 11, 2011 as signed with an emergency clause by the governor.



Ozark stream gravel pushed against bank



Open Pit, mining without a permit

There have been no rule changes in 2010 or 2011, staff is currently comparing the rules to all of The Land Reclamation Act for appropriate additions, revisions and rescissions.

The Land Reclamation Act and the regulations governing tar sands and barite mining remained essentially unchanged during the evolution of the coal mining standards. In 1990, the passage of House Bill 1584 amended the Land Reclamation Act to encompass all non-coal surface mining activity. This includes limestone, sand, gravel, clay, tar sands and barite mining. Sandstone, granite and trap rock quarries also became subject to the 1990 mining regulations.

The revisions require a much more thorough description of the method of operation and reclamation. The public was also included in the permitting process for the first time, through a public notice and comment procedure. In addition, the right of anyone affected by noncompliance at an operation could request a hearing before the Land Reclamation Commission.

Time frames requiring operators to complete reclamation in a timely manner were established. Bonding fees were increased to help ensure the State could complete reclamation if a permit is revoked. Grading to a traversable topography, as well as replacing 12 inches of topsoil is also a requirement. Following these amendments, rules and regulations became effective Feb. 6, 1992.

Fees

Changes to the 2007 edition of the Land Reclamation Act became effective on Aug. 28, 2007. It included a fee increase for operations that mine more than 5,000 tons of sand and gravel per year or any other commodity. The fee is based on an annual permit, bonded acreage and site fee calculation. The rate increase includes an \$800 permit fee, a \$200 to \$400 site fee depending if the site is mined more than six months and a \$10 acreage fee for each bonded acre. A total permit fee will not exceed \$3,000.

Open Pit Limestone Quarry



The fee of \$300 for operators that mine less than 5,000 tons of sand and gravel per year has not changed since 2002. Fees became effective on Aug. 28, 2007 and remain in effect until Dec. 31, 2013.

There is also a new geologic resources fee that will be administered by the department's Division of Geology and Land Survey. This fee includes a \$50 permit fee, a \$50 site fee and a \$6 acreage fee for each bonded acre. The department will use this new geologic resources fee to provide assistance to the industrial minerals industry in identifying the quantity and quality of natural resources. The department will work closely with the newly created Industrial Minerals Advisory Council to establish initiatives and goals for the program.

Missouri Blasting Safety Act

Although the department's Land Reclamation Program does not have any authority concerning blasting related activity, detonations of explosives at quarries is one of the top complaints received by the program. Because of this, the Missouri Legislature introduced the Missouri Blasting Safety Act (House Bill 298).

The governor signed the Missouri Blasting Safety Act on July 13, 2007. The State Fire Marshall's office implements this act. The Blasting Safety Act requires individuals using explosives to have or be supervised by a person with a blaster's license, with some exceptions. The act directs the Division of Fire Safety to create a blaster's licensing program.

The act lays out qualifications for license applicants, which include completing an approved blaster's training course and passing a licensing examination. Licenses are valid for three years and may be renewed upon the applicant meeting renewal requirements as specified in the act. Blaster's licenses shall be required within 180 days of the division publishing licensing rules.

Contact the Division of Fire Safety at 573-751-2930 to learn more about these requirements.



*Ripley County
Current River
Gravel Bar*

Mining versus Development

Amendments made in 2005 to the Land Reclamation Act provide further clarification about land development. Land development sites sometimes have excess material due to excavation activities. In some cases, industrial minerals make up the majority of excavated material. The Land Reclamation Act provides permit exemptions for construction excavations to protect land development sites from being labeled as a mine site. These construction sites must have engineering plans and specifications prepared by an architect, professional engineer or landscape architect. Excavation for construction performed under a written contract that requires excavation of minerals or fill dirt shall be considered construction and exempt from Land Reclamation permitting requirements.

Public Participation

When applying for a new site, transferring an existing site or applying for an expansion, an operator is required to send a notice of intent to operate a surface mine. The operator is required to send the notice by certified mail to all landowners considered adjacent or contiguous, and to the governing body of the counties or cities where the proposed mine area is located. The operator is also required to publish a public notice of intent in a newspaper qualified to run public notices

and is located in the county where the proposed mine is located. The public notice must be printed once a week for four consecutive weeks. The public notice requirement also allows the public an opportunity to provide comments or request a public meeting. The public comment period lasts for 45 days. Operators have the right to respectfully decline a public meeting if they desire. Operators are also holding their own version of a public meeting or “open house” neighborhood gatherings to discuss mine plans when proposing a new site with great success.

Since Aug. 28, 2001, there have been 30 public meetings based on the 2001 edition of the Land Reclamation Act. Attendance figures at the public meeting ranged from a group of five to a crowd of nearly 80 people. Twenty of the public meetings resolved the concerns expressed by the public and did not go as a request for a hearing before the Land Reclamation Commission. Public meetings provide a forum for the public to better understand or resolve issues related to a proposed mine site. They also provide a starting point for a company to reveal the proposed mine plan and provide responses to the public’s concerns. Some of the topics covered at the public meetings involve impacts to air quality, water quality, permitting issues, blasting related issues and livelihood issues. The communication at the meetings allows everyone the opportunity to share and understand the potential impacts a proposed surface mine may present.

Following a public meeting, the Land Reclamation Act at Section 444.773.3, RSMo, requires the staff director to make a formal recommendation regarding the issuance or denial of an applicant's permit.

The director's recommendation is based on several specific items:

- The applicant's compliance with submitting a complete application.
- The applicant's compliance with fulfilling the requirements of a complete application.
- Consideration of any written comments received.
- Whether the operator has had a permit revoked or a bond forfeited.
- If a petition is filed and a hearing is held, the commission shall make the decision.

The industrial minerals permitting program continues to look for ways to improve its methods of helping the public to understand the industrial minerals permitting procedures. Each year, citizens living near proposed mines request six to 10 public hearings on average, about the issuance of permits.

The Land Reclamation Commission granted eight hearings since the 2001 edition of the Land Reclamation Act. Requests for hearings require a tremendous amount of staff time to address and will become increasingly common as mining companies look to open sites near heavily populated areas. In seven cases, the operator was issued a certificate to operate a surface mine. One of the cases involved the operator withdrawing their application. On Sept. 27, 2007, the commission granted a hearing for a Lake Ozark quarry application. The commission did issue the permit and the petitioners filed for an appeal due to the burden of proof being placed on the petitioners. The Miller County Circuit Court ordered the permit be stayed and no further blasting be conducted. That decision was then appealed. The Western District Court of Appeals ordered another hearing be held without the burden of proof being placed on the petitioners. Another hearing was held in October 2012 with the Administrative Hearing Commission. The ultimate decision will rest with the Land Reclamation Commission and will be decided during a meeting of the commission in 2013.

Another hearing that remains in litigation is Strack Excavating LLC. There was a hearing held in July 2011 that covered multiple days. After the hearing, hearing officer W. B. Tichenor issued his recommended order on Aug. 24,

2011, that "the application for expansion be approved with the Mine Plan Boundary (exclusive of underground mining) to be located 1,000 feet from the Strack – Saxony property line, in compliance and as required by section 444.771 RSMo." Shortly after the Land Reclamation Commission decided to accept hearing officer Tichenor's recommendation, The Land Reclamation Program did issue a permit with a condition that reflected the hearing officers recommendation. After the permit was issued, Saxony filed a suit suggesting the commission does not have the right to place a condition on the permit and won that case in Cape Girardeau Circuit Court. This case is now being appealed in the Eastern District Court of Appeals with arguments being scheduled for early February 2013.

New sites and expansions to existing sites are needed to provide building commodities to meet the needs and demands of on-going and new construction.

Routinely, the concerns brought to the commission involve issues outside the regulatory authority provided in the Land Reclamation Act. These issues include concerns about blasting, safety on public roads and the mine's effect on property values. Even so, the commission has encouraged all citizens who have requested hearings under the proper circumstances to personally appear at regularly scheduled commission meetings. The request for a public hearing process has brought an acute awareness to the commission about what is most troubling to the citizens. In return, the public has an opportunity to learn more about the reclamation requirements under the Land Reclamation Act. Continued contact will help pave the way for the citizens to resolve their concerns about mining.

Enforcement

Enforcement powers of the Land Reclamation Commission were enhanced in two significant ways by revisions made in 1990 to the Land Reclamation Act. The commission may impose administrative penalties when notices of violation are issued and they have the option to refer civil actions to the Cole County Court rather than in the county where the violation occurred. These revisions have resulted in more prompt and vigorous action by the operators to eliminate violations. Often, violations observed during an inspection are eliminated through the use of conference, conciliation and persuasion. This process encourages the operator to correct a noncompliance through voluntary action and is used normally in cases of relatively minor noncompliance. If attempts to correct a violation through conference, conciliation and persuasion are not successful, a notice of violation is issued to the operator.

Seventeen notices of violation were issued during 2010 and 2011. Six were administrative in nature, 10 violations involved performance standard requirements and one of the issued violations was a formal complaint. Administrative violations often involve mining without a valid permit or failure to renew a permit. The performance standard violation involved mining below the waterline, channelizing a stream and failure to maintain erosion and sediment on-site. An increase in the number of site inspections at industrial minerals operations typically carries the potential for an increase in enforcement activity during a specific time frame. Since the Land Reclamation Program started conducting environmental assistance visits, the department has noticed mining operators are now more informed about the rules and regulations and are less likely to be in a noncompliance situation. Potential enforcement actions are avoided or minimized through close coordination with the department's Land Reclamation Program staff.

Bond Releases

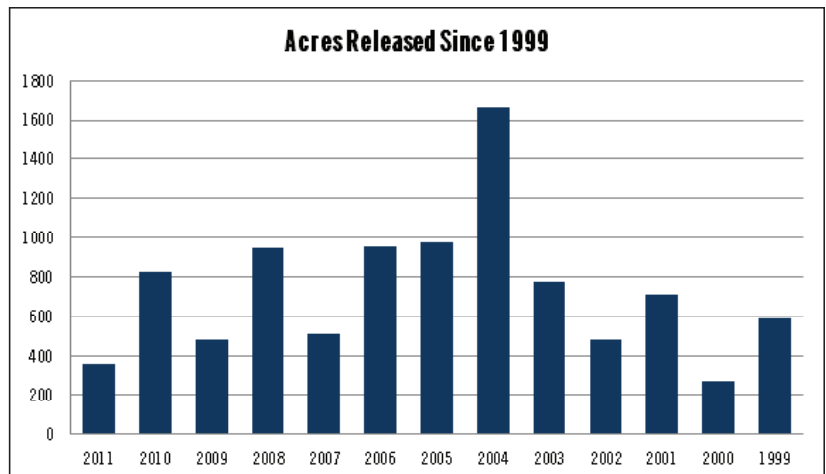
Bond and reclamation liability release is an important part of the mine closure process. An operator initiates the process by completing a *Request for Approval of Reclaimed Land* and submitting this document along with a map that clearly shows the proposed release area. The operator must also mail a completed copy of the *Request for Approval of Reclaimed Land* form and map with a cover letter to the landowner of the requested release area.

Land Reclamation Program staff must inspect conditions at the site and make a recommendation to the staff director or Land Reclamation Commission, which will rule on the bond release request. At least two growing seasons must pass after an area has been planted before the success of revegetation can be judged. Land never affected by mining, but is under permit and bond, may be released as unaffected.

To obtain a *Request for Approval of Reclaimed Land* form, call the department's Land Reclamation Program at 573-751-4041. The form is also available on the Web at www.dnr.mo.gov/forms/index.html#LandReclamation.

Bonding

Open-pit sand and gravel operations mining 5,000 tons per year or less must be bonded at a rate of \$500 per acre before a permit is issued. For all other operations, the minimum bond required for 8-acres or less is \$8,000; every acre over 8-acres requires bond at \$500 per acre. The rules allow for a \$4,500 per acre topsoil bond when there is a failure to salvage topsoil for those acres. Typically,



Barber & Sons Bond Release

in-stream sites are not subject to bonding requirements due to the lack of reclamation responsibility. However, upon inspection, if an in-stream site is determined to have created a reclamation responsibility, bonding requirements of \$500 per acre will be imposed.

The state will use the bond to complete reclamation if the permittee, for whatever reason, is unable or unwilling to fulfill the legal obligation to reclaim the disturbance to the land surface they caused. An operator may secure bond through a surety bond, certificate of deposit, or an irrevocable letter of credit. All bonds must be submitted on forms provided by the Land Reclamation Program.

If an operator elects to use a certificate of deposit to secure bond, the certificate of deposit must be accompanied by a "Personal Bond Secured by a certificate of deposit". The certificate of deposit must also be assigned to the State

of Missouri and the issuing bank must acknowledge this action using the assignment of certificate of deposit. The assignment must be irrevocable and conditioned on the release of the bond by the Land Reclamation Commission. A certificate not assigned to the State must be made payable solely to the State of Missouri. In either case, the interest earned on a certificate of deposit must be made payable to the depositor.

Applicants who wish to increase the number of acres under permit must post additional bond. A surety bond may be increased through a rider with an attached power of attorney. Bonds may be replaced, dollar for dollar, at any time. The old bond cannot be returned until the replacement bond has been submitted and accepted by the Land Reclamation Program staff director. Total program bonding at the end of fiscal 2011 there is record of:

\$20,119,460	Surety bonds
\$ 2,904,170	CD's
\$ 4,769,973	LOC'S
<hr/>	
\$27,793,603	Total amount in Bond

Bond Forfeiture

The Land Reclamation Act went into effect Jan. 1, 1972, and permitted and regulated the mining of limestone, clay, barite, tar sands along with sand and gravel in Missouri. As part of regulation, the companies and individuals participating were obligated to put up a reclamation performance bond in the amount of \$500 per acre for every permitted acre. If an individual or company fails to perform the required reclamation, the bonds would then be forfeited and the State would complete the reclamation.

The bonding amount was subsequently found to be inadequate to cover reclamation costs as well as other inadequacies in the act. Therefore, the act was amended effective Aug. 28, 1990. The amendment added granite, trap rock, sandstone, oil shale and shale to those already regulated and increased the reclamation bonding to a minimum bond of \$8,000 for the first 8-acres and \$500 for every acre permitted thereafter. Between 1972 and 1990, twenty-six sites operated by 14 different companies became bond forfeiture sites and proper reclamation became responsibility of the department's Land Reclamation Program.

In 2003, National Refractories left reclamation responsibilities to the State when it went bankrupt. Due to negotiations with the surety company, a settlement was not reached until October 2006. The surety provided \$85,250 in bond monies to reclaim 25 clay pits for a total of 162.5 acres. After an initial inspection, the department's Land Reclamation Program quickly learned there was not enough bond to properly reclaim the sites in accordance with The Land Reclamation Act. Two sites in particular have a cost estimate of \$200,000 for proper reclamation. The program continues to work with landowners to reclaim these sites. No mining companies have left a reclamation responsibility to the State in 2006 or 2007.

In 2008 and 2009 there was a total of 93 acres forfeited involving two limestone and two sand and gravel mining operations. In 2010 and 2011, there were no bond forfeited acres.

Sand and Gravel Rules

On Sept. 15, 2001 the Land Reclamation Commission published proposed rules in the Missouri Register, which were intended to mirror the Water Protection Program's gravel removal guidelines. During the period that followed, the Land Reclamation Program received many comments concerning these proposed rules. The commission decided to hold four public meetings around the state in an effort to publicize the reason for the rules and explain the department's interpretation of them. These meetings were held in December 2001, followed by a public hearing on Jan. 24, 2002. After deliberation, the commission decided to form a workgroup to review and possibly revise the proposed rules. The workgroup included members from industry, landowners, anglers, hydrologists, environmental groups, government agencies and others with an interest in streams and gravel mining. The workgroup was mandated to come up with suggestions for rules that would be acceptable to all interested parties. The rules for in-stream sand and gravel mining operations became effective in May 2005.



In-Stream Sand and Gravel Mining

In-stream sand and gravel mining is one of the most prevalent types of mining in Missouri, as far as the number of sites. This type of mining isn't just seeing a piece of excavating machinery in the flowing portion of the stream, it is more of a bar skimming mining operation.

Bar skimming is limited to the exposed portion of the gravel bar above the water line, between the ordinary high banks of a stream. Bar skimming is recommended as a means for advancing stream resource conservation while maintaining a viable extraction industry. This type of gravel removal operation lowers the risk of forward erosion of the stream channel upstream and sedimentation downstream. In addition, the practice of removing gravel at periods of low water flow will aid in protecting wildlife near the stream environment. Some of the new rules include, staying an adequate distance from the stream bank, use of existing crossing areas, leaving an undisturbed buffer of 10-feet from the flowing water line and no mining below the water line unless the operator has applied for and received a variance.

In fiscal 2009, there were 281 permitted in-stream sites. Numerous operators across the state excavate sand and gravel deposits, commonly known as gravel bars, as a source of aggregate material.

*Madison County Wood
Products Gravel Bar*

During the 1990s this activity underwent several changes in regulatory control within Missouri. In the early 1990s, the department's Land Reclamation Program was the permitting and enforcement authority that both issued permits for this type of mining activity and also oversaw the proper removal of sand and gravel from Missouri's streams. In the mid 1990s, the regulation of this activity was taken up by the Army Corps of Engineers who took over the entire process of permitting and inspecting these mining facilities. The Army Corps of Engineers lost their jurisdiction over this activity in late 1998 due to a ruling by the U.S. District Court of Appeals. The court found that "de-minimus" or incidental fall back of sand and gravel into the stream from which it was being excavated did not constitute the placement of fill by the mining operation. Hence, the court ruled the Army Corps of Engineers had exceeded its authority in requiring a permit for this activity.

In January 1999, the Land Reclamation Program resumed the former position of the regulatory authority over this type of mining activity and bases this authority upon the provision of the state's Land Reclamation Act. Approximately 150 permits were re-issued to the mining industry during the early months of 1999 by the Land Reclamation Program to take the place of the existing Army Corps of Engineer's permits. This Land Reclamation Program continues to be the regulatory authority to this day.

Spotlight on the Ozarks: Sand and Gravel Mining

Sand and gravel mining operators in the Ozarks face challenges that operators in other regions of Missouri do not experience. The greatest regulatory challenge for sand and gravel operators is conducting mining and processing operations within the watershed of an Outstanding National or State Resource Waters.

Outstanding resource waters are defined by the Missouri Department of Natural Resources' Water Protection Program as state or national waters:

- Outstanding state resource waters are high quality waters with a significant aesthetic, recreational or scientific value, specifically designated as such by the Clean Water Commission.
- Outstanding national resource waters are waters that have outstanding national recreational and ecological significance. These waters shall receive special protection against any degradation in quality. Congressionally designated rivers, including those in the Ozark national scenic river ways and the wild and scenic rivers system, are so designated.

The Ozark counties of Phelps, Crawford, Dent, Shannon, Reynolds, Texas, Carter, Douglas and Howell contain a majority of the either state or national outstanding resource waters. There are some smaller designated areas present in a few other counties scattered about the state. In-stream sand and gravel operations are prohibited from those waters listed as outstanding national resource waters. Clean water laws require mining operations within national outstanding resource watersheds to have a no discharge system. Discharges at sites in outstanding state resource watersheds shall not cause the current water quality in the streams to be lowered. Because of this regulation, the department's Land Reclamation Program issues a letter of six extra conditions along with a certificate to operate a surface mine to operators in these watersheds. Five of the conditions are applicable to all

other operators as part of their standard sand and gravel excavation plan. The one condition that is not required of all other operators is the mined gravel bar is left nearly level at the end of the day. This is accomplished by back dragging any ledge or ridge created by the excavation. Most operators do this already and it does not present a financial burden to their operation. The mine site is not the only portion of the operation subject to the Water Protection Program's no-discharge requirements.

A no discharge system is also required for washing and other processing areas along with all other types of businesses that operate in an outstanding resource watershed. It is possible to operate a no-discharge sand and gravel wash plant. Spring Creek Materials currently operates mine sites and wash plants in compliance with the no discharge requirements. Owner Travis Morrison reports the only other alternative is to have sand and gravel shipped in from more than 150 miles away from the Missouri River. Shipping doubles the price of that material for every 35 miles of travel. In this case, sand could cost up to \$85 per ton, not a viable option as it would be reflected in construction costs. Currently, there is an adequate supply of sand and gravel to meet growth demands in the outstanding resource watersheds of the Ozarks as this region is not experiencing the economic growth demands when compared to Branson, St. Louis or Kansas City.

Mining and economic development projects in the watersheds of outstanding resource waters are subject to either no discharge requirements or shall not cause the current water quality in the streams to be lowered. Operators in the Ozarks want universal and fair treatment for all mine operators in the state. Operators inform the department to keep in mind the impacts the water quality standards have on economic development as these decisions affect day to day operations. Ozark operators are managing their business on a thin line and believe extra conditions imposed on their operation are unfair circumstances. The University of Missouri's CARES website provides aerial photographs from 2007, allowing operators to locate isolated gravel bars. Inspectors also use this website to measure disturbed acreage at quarry operations. To view a site from the air, visit the website at www.cares.missouri.edu.

METALLIC MINERALS

Introduction and Purpose

The Metallic Minerals Waste Management Act, enacted into law in 1989, gives regulatory authority to the director of the Department of Natural Resources to have and exercise all powers provided in sections 444.352 – 444.380 of this act. The Metallic Minerals Waste Management Act regulates disposal of waste from metallic minerals mining, beneficiation and processing. Some of the director's duties are to secure appropriate staff, coordinate existing environmental programs, issue permits, make inspections, manage fees, maintain records of management practices, seek additional funds, publish rules and pursue appropriate enforcement actions. The minerals covered by the Metallic Minerals Waste Management Act are those minerals or ores containing lead, iron, zinc, copper, gold and silver. A Metallic Minerals Waste Management Permit was required no later than six months after Aug. 28, 1989 for any active metallic minerals waste management areas operating under a National Pollutant Discharge Elimination System permit, or dam safety registration, or both, or within 90 days after filing an application for an National Pollutant Discharge Elimination System construction permit or dam safety construction permit, whichever is applied for first. The operator applied to the director for a metallic minerals waste management area permit. Today, operator applications contain but are not limited to, a schedule and plan for closure and inspection-maintenance of the waste management area. Operators will implement the plan when the useful operating life of the waste management area is complete or when there is permanent cessation of the operation.

Permitting

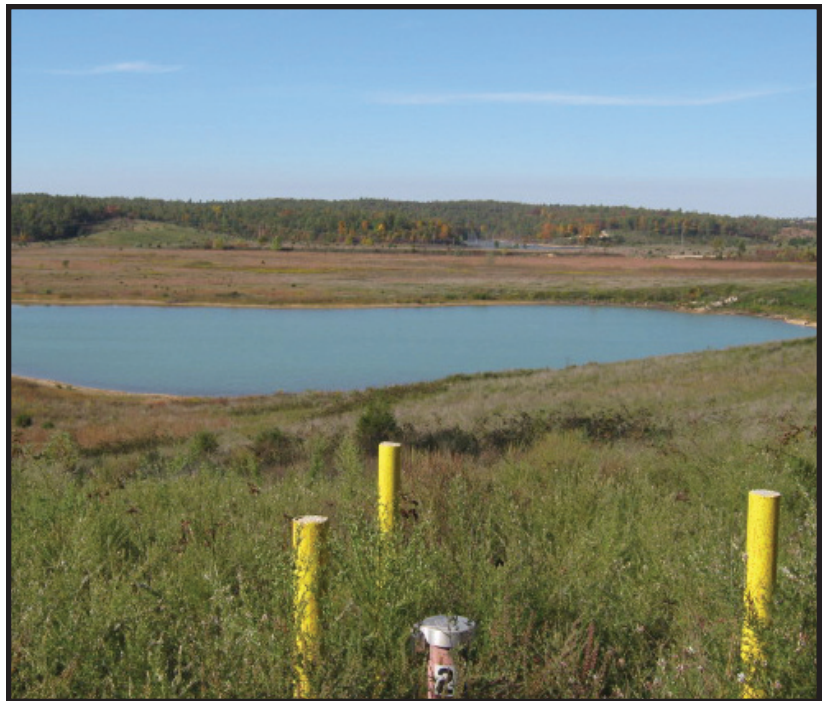
In 1991, the Department of Natural Resources issued 11 permits to operators under the Metallic Minerals Waste Management Act. During 2001 and 2002, the program continued the five year review of the metallic minerals waste management permits. In 2002, the only underground iron ore producer, the Pea Ridge Iron Ore Company transferred its 180 acre permit

area to an entity by the name of Upland Wings Inc.

Metallic minerals waste management permit applications consist of financial assurance information and detailed waste management area closure and inspection-maintenance plans. The plans establish and explain the technical steps proposed to accomplish and maintain closure after mining and waste disposal is completed.

Issues addressed in the plans include:

- The design and construction of waste control structures and tailings dams.
- The characterization of waste products.
- The methods for control and protection of surface water.
- The methods for protection of groundwater and aquifers.
- The geology and seismicity of the area.
- The potential of subsidence.
- The reuse and off-site removal of wastes.
- The surface reclamation of waste management areas. *Teck Cominco Magmont Mine*



During the on-going permit application review, the Land Reclamation Program is coordinating with the other Department of Natural Resources' programs involved with the metallic minerals waste management areas. These include Air Pollution Control Program, Solid Waste Management Program, Hazardous Waste Program, Water Protection Program, Soil and Water Conservation Program, and Division of Geology and Land Survey. The coordination process will allow the other programs to review and comment about the technical aspects of the plans so all the departments' issues may be incorporated into the permit.

The Doe Run Company's Buick Resource Recycling Division is being operated under a Hazardous Waste Program landfill permit. This landfill site encompasses the current metallic mineral waste management area permitted by the Land Reclamation Program. The Hazardous Waste Program's permit is more restrictive and requires a much more significant clay cap over the old slag pile. This would mean much better environmental protection; due in part to the fact the site must meet post closure requirements for 30 years after closure date.

The Land Reclamation Program was involved with the department-wide inspection and surveillance activities performed at the Doe Run Company's Herculaneum smelter. In May 2001, the department, the Environmental Protection Agency and the Doe Run Company signed a voluntary Administrative Order on Consent. The order requires the company to conduct certain response actions to abate an imminent and substantial endangerment to the public health, welfare and environment.

The Land Reclamation Program has been monitoring the construction of a containment berm around the perimeter of the current slag pile, which was required in the order. Construction of the berm has been underway since spring 2007, and was completely graded in 2009. Topsoil was added in 2010 and it was partially vegetated in 2011. It should be completely vegetated by 2012.

Inspection

Typically, inspections are performed semi-annually on the 11 metallic minerals waste management permit areas within Missouri. During the course of these inspections, all aspects of each company's permits are evaluated. The main focus of these inspections is to assess the company's compliance with virtually every environmental law is

The Doe Run Company Buick Mine Waste Management Storage Facility



administered by the Missouri Department of Natural Resources. The Land Reclamation Program is entrusted as the coordinating agency within the department for each active metallic mineral producer currently operating in Missouri. It is the program's responsibility to act as the liaison for the other programs within the department and each metal producer to ensure continuing compliance with all applicable state environmental laws.

Actual on-the-ground reclamation does not begin at these sites until mineral production is stopped, and mine closure begins. Only one lead producer in Missouri is in active closure at the present time. Teck-Cominco American's Magmont Mine ceased production in 1995 and began the actual reclamation of the surface effects after almost 30 years of lead mining and processing. During 2001 and 2002, three more facilities ceased production. The Pea Ridge Iron Ore Company's Pea Ridge mine ceased active mining operations and transferred its metallic minerals permit to a non-mining company named Upland Wings Inc. The Doe Run Company's Viburnum mine and Buick smelter also ceased production. The Doe Run Company's Glover smelter is in the process of receiving approval from the department for a partial closure of an old slag pile at its facility. The closure and inspection-maintenance plans for these mines and smelters are either being reviewed by the department at this time or the department is waiting for submittal of revised closure plans for review and approval.

Enforcement

To date, four enforcement actions under the provisions of the Metallic Minerals Waste Management Act have been necessary by the program. Enforcement actions took place at two smelters and two mines. These actions included violations for construction of a waste management control structure prior to department approval, the failure of two facilities to contain metallic mineral wastes within their approved waste management areas and the failure of a now bankrupt facility for failure to submit annual permit fees.

Enforcement under this law is significantly different from enforcement under either the coal or industrial minerals units of the program. When it becomes necessary to issue a citation to any of the metal producers, the authority to do so rests solely with the director of the Department of Natural Resources. Enforcement is only authorized by law after attempts to eliminate the violation through conference, conciliation and persuasion have been exercised and exhausted.

INFORMATION ON THE INTERNET

Missouri Department of Natural Resources

Department Home Page	www.dnr.mo.gov
Land Reclamation Program	www.dnr.mo.gov/env/lrp/index.html
The Complete Missouri Mining Law	www.moga.mo.gov/statutes/c444.htm

U.S. Department of Interior Office of Surface Mining

Office of Surface Mining, Washington DC	www.osmre.gov/osm.htm
Office of Surface Mining - Mid-Continent Regional Coordinating Center, Alton, IL	www.mcrc.osmre.gov

Other Mining and Reclamation Organizations

National Association of Abandoned Mine Land Programs	www.naamlp.net
Interstate Mining Compact Commission	www.imcc.isa.us
National Association of State Land Reclamationists	www.crc.siu.edu/naslr.htm Missouri
Limestone Producers Association	www.molimestone.com
The Mining Industry Council of Missouri	www.momic.com



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